REMARKS

The Applicants respectfully request reconsideration of the present Application. The Applicants believe that the present Application is now in condition for allowance. Favorable reconsideration of the Application as amended is respectfully requested.

Status of the Claims

Claims 51-90 are cancelled without prejudice to further prosecution on the merits. Applicants wish to make it clear that they do not agree to or acquiesce in the rejections of Claims 51-90, but have cancelled the claims to further prosecution on the merits.

New Claims 91-148 are being added to present claims of varying scope.

This amendment adds, changes and/or deletes claims in the present Application. A detailed listing of claims that are, or were, in the Application, irrespective of whether the claim(s) remain under examination in the Application, is presented, with an appropriate defined status identifier.

Claims 91-148 are now pending in this Application. [1]

Nonstatutory Double Patenting Rejection

On page 2 of the Office Action, the Examiner rejected Claims 51-90 under the judicially created doctrine of double patenting over the copending Claims 30-71 of U.S. Application No. 09/627,522 ("the '522 Application). The present Application and the '522 Application are commonly owned.

The Applicants request that the provisional double patenting rejection of Claims 51-90 over Claims 30-71 of the '522 Application be held in abeyance until allowable independent claims are indicated by the Examiner in the present Application (since a timely filed

[1] Claims 51-90 have been cancelled. New independent Claim 91 (and corresponding dependent Claims 92-110), new independent Claim 111 (and corresponding Claims 112-128), and new independent Claim 129 (and corresponding Claims 130-148) have been added to recite in proper form subject matter that is not anticipated by Larsen et al. '566, and is patentable over Larsen et al. '566 and Larsen '451. By canceling and adding such claims, the Applicants wish to make it unmistakably clear that they do not agree to or acquiesce in the rejection of Claims 51-90 under 35 U.S.C. §§ 102(e) and 103(a) and/or agree with the Examiner's view of the scope and the content (i.e., disclosure) of Larsen et al. '566 and Larsen '451. Such claims have been cancelled only to further prosecution on the merits.

terminal disclaimer would overcome the rejection such that further consideration of the claims on that rejection should not be necessary). 37 C.F.R. § 1.111(b).

Claim Objections

On page 4 of the Office Action, the Examiner objected to Claims 55 and 65. The Examiner stated that Claim 55 "is objected to because of the following informalities: the claim recites 'the silver content of the alloy is less than 0.01 percent,' which is inconsistent with claim 51 that recites 'silver in the range of about 0.0005 percent to about 0.012 percent.'" The Examiner stated that Claim 65 is "of improper dependent form for failing to further limit the subject matter of a previous claim."

Claims 55 and 65 have been cancelled without prejudice to further prosecution on the merits. Claims 91-148 do not contain the informalities cited by the Examiner. Accordingly, the objections have been overcome.

Claim Rejections – 35 U.S.C. § 112 ¶ 2

On page 4 of the Office Action, the Examiner rejected Claim 79 under 35 U.S.C. § 112 ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention.

Claim 79 has been cancelled. Claims 91-148 are in compliance with 35 U.S.C. § 112 ¶ 2. Accordingly, the rejection under 35 U.S.C. § 112 ¶ 2 has been overcome.

Claim Rejections – 35 U.S.C. §§ 102(e)/103(a) - Larsen et al. '566

On page 5 of the Office Action, the Examiner rejected Claims 51-90 under 35 U.S.C. §§ 102(e)/103(a) as being anticipated by, and alternatively unpatentable over U.S. Patent No. 5,948,566 to Larsen et al. ("Larsen et al. '566").

The Examiner stated that:

> [Larsen et al. '566] teaches a sealed lead-acid battery (col. 11, lines 35-39) having a positive plate, a negative plate and a separator between the plates (col. 8, lines 20-36). An active material paste is applied to a grid supporting structure to form the positive plate

> (col. 7, lines 24-43). The positive grid alloy comprises a lead-based calcium-tin-silver alloy in which, based upon the total weight of the alloy, calcium is present in a range of from about 0.01% to 0.06%, tin is present in a range of from about 0.3% to 1.0% and silver is present in a range of about 0.01% to 0.06%. Note the ratio of tin to calcium may be greater than 20:1. Optionally, aluminum can be included in an amount from about 0.003% to 0.010%. See col. 11, lines 7-14.

The Examiner also stated that "'for an SLI battery' (claim 51), 'for use in a starting, lighting, and ignition lead-acid battery' (claim 64) and 'A lead-acid starting, lighting, and ignition battery' (claim 78), [Larsen et al. '566] teaches the grids and plates disclosed therein are useful in any desired lead-acid cell/battery application (col. 3, lines 44-56)."

The Examiner concluded "[t]hus, the claims are anticipated."

Larsen et al. '566 is directed to a "method of making lead-acid grids and cells and batteries using such grids" and a "continuous process for making a directly cast strip to provide a thickness satisfactory for industrial cells" (emphasis added) (see Abstract). Larsen et al. '566 acknowledges a distinction between "thinner grids for SLI batteries" and "thicker grids for industrial applications" (see col. 3, lines 63-65) (emphasis added). Larsen et al. '566 states that "[i]t is accordingly a principal object of the present invention to provide a commercially viable process for making grids suitable for lead-acid cells for industrial/battery applications" (emphasis added) (see Background of the Invention, col. 3, lines 36-40). Larsen et al. '566 also states that "[t]he present invention is, in general, predicated on the discovery that a continuous method of making grids of thicknesses suitable for industrial battery applications can be achieved" (emphasis added) (see col. 3, lines 59-62). Larsen et al. '566 further states:

> While the present invention will be described herein principally in connection with making grids and plates for VRLA sealed lead-acid cells and batteries, it should be appreciated that this invention is equally applicable to making grids and plates for flooded electrolyte cells and batteries for use in industrial battery applications. Such applications are known, and some have been discussed herein. Indeed, the present invention is useful in making thick grids and plates for any desired lead-acid cell/battery application.

See Background of the Invention, col. 3, lines 44-56 (emphasis added). Larsen et al. '566 further states that "[t]he grids thus made find substantial utility in sealed lead-acid batteries and in other cells and batteries for industrial applications" (col. 11, lines 35-37) (emphasis added).

Independent Claims 91, 111 and 129 of the present Application are directed to a "lead-acid cell for an SLI battery configured for use in vehicle applications" comprising, in combination with other elements, a "thin grid supporting structure" and an alloy comprising "silver in the range of greater than 0 to less than 0.015 percent" (Claims 91 and 129) or "silver in the range of greater than 0 to about 0.0124 percent" (Claim 111).

As to the alloy composition of the lead acid grids and cells, Larsen et al. '566 includes the following paragraphs:

> As far as the positive grids are concerned, one type of the prèferred grid alloys comprise lead-based calcium-tin-silver alloys in which, based upon the total weight of the alloy, calcium is present in a range of from about 0.01% to 0.06%, tin is present in a range of from about 0.3% to 1.0% and silver is present in a range of about 0.01% to 0.06%. Optionally, to prevent drossing, aluminum can be included in an amount from about 0.003% to 0.010%.
>
> For the extended service life applications, such as telecommunications, where 10 to 20 years of service are desired, grid alloys imparting high mechanical properties to the resulting grid are preferred. One desirable family of alloys comprises lead-based alloys including about 0.02% to 0.05% calcium, from about 1.5% to 3.0% tin, and from about 0.01% to 0.05% silver. To prevent drossing of calcium, aluminum in an amount of from about 0.003% to 0.010% may be used.

Col. 11, lines 7-22 (emphasis added). The range of tin in "[o]ne desirable family of alloys" is "from about 1.5% to 3.0% tin." See Larsen et al. '566 at col. 11, lines 19-20 (emphasis added). The range of silver is in a range of no less than 0.01 percent to up to 0.05 percent or 0.06 percent in each of the alloys in Larsen et al. '566.

Notably, Larsen et al. '566 does not disclose any specific examples of an alloy having a composition as recited in Claims 91-148 of the present Application. Accordingly, Larsen et al. '566 does not actually teach any alloy (having a composition as claimed in the

present Application) with "sufficient specificity" to constitute anticipation of Claims 91-148. See M.P.E.P. § 2131.03 ("In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with sufficient specificity to constitute an anticipation under the statute."). Larsen et al. '566 does not identify any unexpected result achieved by an alloy having a composition as recited in Claims 91-148 of the present Application. Larsen et al. '566 discloses no understanding of the effects realized in the claimed narrow ranges of the alloy composition of Claims 91-148.

The present Application discloses unexpected results within the claimed narrow ranges of the alloy composition of Claims 91-148. Compare for example Figures 10-12 of the present Application. Larsen et al. '566 does not identically disclose the "lead-acid cell for an SLI battery" recited in independent Claims 91, 111 and 129.

A rejection of Claims 91-148 as anticipated by Larsen et al. '566 under 35 U.S.C. § 102(e) would be improper. Claims 91-148 are patentable over Larsen et al. '566 under 35 U.S.C § 102(e).

On page 6 of the Office Action, the Examiner stated that "[t]he claims are alternatively unpatentable." The Examiner stated that "[t]he claim limitation 'formed by book mold gravity casting' is a product-by-process limitation" and that "[t]he courts have ruled that product-by-process limitation, in the absence of unexpected results, are obvious." The Examiner also stated that "[Larsen et al. '566] at least suggests the grids may be made by gravity casting." The Examiner further stated that "[r]egarding the claim limitations 'for an SLI battery' (claim 51), 'for use in a starting, lighting, and ignition lead-acid battery' (claim 64) and 'A lead-acid starting, lighting, and ignition battery' (claim 78) [Larsen et al. '566] teaches the grids and plates disclosed therein are useful in any desired lead-acid cell/battery application (col. 3, lines 44-56).

The "lead-acid cell for an SLI battery" recited in independent Claims 91, 111 and 129 would not have been obvious in view of Larsen et al. '566, alone or in any proper combination under 35 U.S.C. § 103(a). Larsen et al. '566 alone or in any proper combination does not disclose, teach or suggest a "lead-acid cell for an SLI battery," comprising, in combination with other elements, "a thin grid supporting structure formed by book mold gravity casting," as recited in Claims 91-148. To transform the "lead-acid grids and cells" of Larsen et

al. '566 (e.g. thick grid for industrial cells) into a "lead-acid cell or an SLI battery" with a "thin grid supporting structure" with an alloy composition that achieves the unexpected results set forth in the present Application (as recited in Claims 91-148) would require still further modification, and such modification is taught only by the Applicant's own disclosure. The suggestion to make the combination has been taken from Applicant's own specification (using hindsight), which is improper.

The "lead-acid cell for an SLI battery" recited in independent Claims 91-148, considered as a whole, would not have been obvious in view of Larsen et al. '566. A rejection of Claims 91-148 over Larsen et al. '566 under 35 U.S.C. § 103(a) would be improper. Claims 91-148 are patentable over Larsen et al. '566.

Claim Rejections – 35 U.S.C. § 103(a) – Larsen '451

On page 6 of the Office Action, the Examiner rejected Claims 51-90 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,423,451 to Larsen ("Larsen '451"). The Examiner stated that:

> [Larsen '451] teaches a sealed lead-acid cell having a container, a positive plate, a negative plate and a separator between the positive and negative plate (col. 8, lines 30-42). The positive plate comprises a grid and a positive active material pasted onto the grid (col. 8, lines 8-12). [Larsen '451] teaches that the grid supporting structure comprises a lead-based alloy consisting essentially of lead, from about 0.02% to about 0.05% calcium, from about 1.5% to about 3.0% tin and from about 0.01% to about 0.05% silver (see abstract). Note that the tin to calcium ratio is greater than 20:1. Optionally, the alloys can include from about 0.003% to 0.03% by weight of aluminum (col. 5, lines 8-9). [Larsen '451] teaches that the grids may be formed by conventional casting techniques such as gravity casting ('book molds' or the like) and continuous processes using expanded metal techniques (col. 2, lines 25-32 and col. 7, lines 40-47). The grids of [Larsen '451] may be used in any lead-acid cell or battery including, for example, automotive (flooded starting, lighting and ignition), bipolar and the like (col. 12, lines 12-17). Table 4 teaches a specific lead based alloy grid having 2.0% tin, 0.006% silver, 0.040% calcium and the balance lead. Note the alloy (Alloy E) has a ratio of tin to calcium of 50:1 (2/0.04).

The Examiner acknowledged that Larsen '451 "does not explicitly disclose a grid supporting structure having the alloy composition of the instant claims." However, the Examiner concluded that "the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties," citing M.P.E.P. § 2144.05.

Larsen '451 is directed to a "Lead-Acid Cell and Positive Plate and Alloy Therefor," and that is described as "allowing use in VRLA cells for motive power and stationary applications" (see col. 5, lines 10-12).[2] Larsen '451 discloses an alloy composition with tin in a range of about 1.5 percent to about 3.0 percent (see Abstract; col. 5, line 5; col. 7, lines 10-24; Examples 1-6). None of the examples given in Larsen '451 include tin in an amount less than 1.5 percent (see, e.g., Example 6). Larsen '451 does not identify any effect of tin in a range below 1.5 percent (see, e.g., Examples 1-6). Larsen '451 concedes that (emphasis added):

> As to the tin constituent, the issue is even more complex. Thus, while the tin level will certainly affect the characteristics as the grid is being cast and the mechanical properties of the cast grid, the tin level will also impact upon the issues of corrosion, cycling, thermal runaway, and capacity loss characteristics. These diverse criteria are not fully understood; and, despite the prior work in this field, the impact of the tin level on the characteristics of VRLA cells has not been appreciated to any great extent.

Col. 7, lines 1-9 (emphasis added). Larsen '451 nonetheless states that "[m]ore particularly, it is preferred to maintain the tin in the range of from about 2.0% to about 3.0%, more preferably 2.0% to 2.5%, by weight of the alloy." (col. 7, lines 10-18).

The "lead-acid cell for an SLI battery configured for use in vehicle applications" recited in independent Claims 91, 111 and 129 would not have been obvious in view of Larsen '451. Larsen '451 alone or in any proper combination, does not disclose, teach or suggest, a "lead-acid cell for an SLI battery "wherein the grid supporting structure comprises . . . tin in the

[2] See also Larsen '451 at col. 1, lines 35-40 (describing "stationary applications") and lines 53-57 (describing "motive power application [sic]").

range of greater than 0.5 percent to about 1.2 percent" (Claim 91) or "... about 0.5 percent to about 1.2 percent" (Claim 111) or "... about 0.8 percent to about 1.2 percent." Larsen '451 does not teach or show any recognition of either the alloy composition itself that recited in the "lead-acid cell for an SLI battery configured for use in vehicle applications" recited in independent Claims 91, 111 and 129 or of the expected properties of the recited alloy composition. Claims 91, 111 and 129 are clearly patentable over Larsen '451.

The "lead-acid cell for an SLI battery" recited in Claims 91-148 would not have been obvious in view of Larsen '451, alone or in any proper combination under 35 U.S.C. § 103(a). Larsen '451 alone or in any proper combination does not disclose, teach or suggest a "lead-acid cell for an SLI battery" comprising, in combination with other elements, the recited alloy composition. To transform the lead acid cell for motive power and stationary applications with a grid of an alloy having tin in a range of 1.5 percent to 3.0 percent of Larsen '451 into a "lead-acid cell for an SLI battery" with a grid supporting structure of an alloy having tin in a range of "greater than 0.5 percent to about 1.2 percent" (Claim 91) or "... about 0.5 percent to about 1.2 percent" (Claim 111) or "... about 0.8 percent to about 1.2 percent." (Claim 129) would require still further modification, and such modification is taught only by the Applicants' own disclosure. The suggestion to make the combination has been taken from the Applicants' own specification (using hindsight), which is improper.

The "lead-acid cell for an SLI battery" recited in Claims 91-148, considered as a whole, would not have been obvious in view of Larsen '451. A rejection of Claims 91-148 over Larsen '451 under 35 U.S.C. § 103(a) would be improper. Claims 91-148 are patentable over Larsen '451.

* * *

The Applicants respectfully submit that each and every outstanding objection and rejection has been overcome, and the present Application is in a condition for allowance. The Applicants request favorable consideration and allowance of pending Claims 91-148.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present Application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this Application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to the Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, the Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment of any such extension fees to Deposit Account No. 06-1447.

Respectfully submitted,

Date 1/15/04

By _____

FOLEY & LARDNER
Suite 3800
777 East Wisconsin Avenue
Milwaukee, Wisconsin 53202-5306
Telephone: (414) 297-5872
Facsimile: (414) 297-4900

Scott M. Day
Attorney for Applicant
Registration No. 52,801